

reference  
guide

# hp StorageWorks MSL5000 and MSL6000 series pass-through mechanism

Fourth Edition (June 2003)

**Part Number:** 231908-004

This guide is to be used as step-by-step instructions for installing and configuring an HP StorageWorks MSL5000 and MSL6000 Series Pass-Through Mechanism.



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HP StorageWorks MSL5000 and MSL6000 Series Pass-Through Mechanism Reference Guide  
Fourth Edition (June 2003)  
Part Number: 231908-004

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## about this guide

This reference guide provides information to help you:

- Install the PTM.
- Configure the PTM.

About this Guide topics include:

- [Related Documentation](#), page 8
- [Conventions](#), page 8
- [Rack Stability](#), page 11
- [Getting Help](#), page 12

## Related Documentation

In addition to this guide, HP provides corresponding information:

- *HP StorageWorks MSL5000 and MSL6000 Series Tape Libraries User Guide*
- *HP StorageWorks MSL5000 and MSL6000 Series Tape Libraries Maintenance and Service Guide*

## Conventions

Conventions consist of the following:

- [Document Conventions](#)
- [Text Symbols](#)
- [Equipment Symbols](#)

## Document Conventions

The document conventions included in [Table 1](#) apply.

**Table 1: Text Conventions**

Element	Convention
Cross-reference links	Blue text: <a href="#">Figure 1</a>
Key and field names, menu items, buttons, and dialog box titles	<b>Bold</b>
File names, application names, and text emphasis	<i>Italics</i>
User input, command and directory names, and system responses (output and messages)	Monospace font COMMAND NAMES are in uppercase monospace font unless they are case sensitive.
Variables	<monospace, italic font>
Website addresses	Blue underlined sans serif font text: <a href="http://www.hp.com">http://www.hp.com</a>



## Text Symbols

The following symbols may be found in the text of this guide. They have the following meanings.



**WARNING:** Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.

---



**Caution:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

---

---

**Note:** Text set off in this manner presents commentary, sidelights, or interesting points of information.

---

## Equipment Symbols

The following equipment symbols may be found on hardware for which this guide pertains. They have the following meanings.



Any enclosed surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

**WARNING:** To reduce the risk of personal injury from electrical shock hazards, do not open this enclosure.

---



Any RJ-45 receptacle marked with these symbols indicates a network interface connection.

**WARNING:** To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

---



Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury.

**WARNING:** To reduce the risk of personal injury from a hot component, allow the surface to cool before touching.

---



Power supplies or systems marked with these symbols indicate the presence of multiple sources of power.

**WARNING:** To reduce the risk of personal injury from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.

---



Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

**WARNING:** To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manually handling material.

---

## Rack Stability

Rack stability protects personnel and equipment.



**WARNING:** To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
  - The full weight of the rack rests on the leveling jacks.
  - In single rack installations, the stabilizing feet are attached to the rack.
  - In multiple rack installations, the racks are coupled.
  - Only one rack component is extended at any time. A rack may become unstable if more than one rack component is extended for any reason.
-

## Getting Help

If you still have a question after reading this guide, contact an HP authorized service provider or access our website: <http://www.hp.com>.

## HP Technical Support

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**Note:** For continuous quality improvement, calls may be recorded or monitored.

---

Call technical support at the nearest location. Telephone numbers for worldwide technical support are listed on the HP website under support:  
<http://www.hp.com/support>.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Application software and version

## HP Storage Website

The HP website has the latest information on this product, as well as the latest drivers. Access storage at:  
<http://thenew.hp.com/country/us/eng/prodserv/storage.html>. From this website, select the appropriate product or solution.

## HP Authorized Reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP website for locations and telephone numbers:  
<http://www.hp.com/support>.

# Introduction

## 1

The HP StorageWorks Pass-Through Mechanism (PTM) enables the transfer of tape cartridges between HP StorageWorks MSL5000 and MSL6000 Series tape libraries. A single PTM system can be used to create a multi-unit tape library configuration by connecting:

- Up to eight two-drive libraries
- Up to four four-drive libraries
- A combination of two- and four-drive libraries equivalent to a 40U height

---

**Note:** See [“Planning the Installation”](#) on page 18 for specific configuration details.

---



**Caution:** To avoid damage to the equipment and loss of data, all multi-unit tape library components (libraries and PTM components) must be LTO Ultrium capable.

---

---

**Note:** All MSL Series libraries in a multi-unit library configuration must use the same drive types. Check with your application software vendor to manage partitioning by tape technology if you want to mix drive types in a multi-unit library configuration.

Mixed media using Ultrium cartridges is not supported on libraries with firmware levels of 4.04 or earlier.

---

The PTM installation procedure consists of the following steps:

- Preparing for the PTM installation
- Installing the PTM
- Cabling the PTM
- Configuring the PTM

---

**Note:** An MSL Series PTM is not compatible with either a TL series or an SSL series PTM.

---

## Preparing for the PTM Installation

Before beginning the installation procedure:

1. Using the packing slip, verify the components that came with the PTM Upgrade Kit.
2. Make sure that you have the required tools (see “[PTM Required Tools](#)” on page 15).
3. Make sure the library is functional.
4. Make sure that you are using the proper version of firmware. See “[Verifying the Firmware Level](#)” on page 57.

## PTM Components

The following components typically ship with a PTM kit:

- PTM (base unit)
- LAN hub and bracket
- Primary motor cable
- AC power cord (U.S. only -- country-specific cords are not provided)
- Ethernet cables

The following components ship with an Extender Upgrade Kit:

- One ethernet cable
- 5U or 10U extension
- Attachment hardware

## PTM Required Tools

The following tools are required to perform a PTM installation:

- #2 Phillips screwdriver (stubby or right-angle)
- #1 Phillips screwdriver
- Flat-blade screwdriver
- Large paper clip
- Diagonal cutting pliers





# Installing the PTM

## 2

This chapter describes how to install a Pass-Through Mechanism (PTM) for an HP StorageWorks MSL5000 or 6000 Series tape library. Sections in this chapter include:

- [Planning the Installation](#), page 18
- [Positioning the Libraries](#), page 20
- [Installing the LAN Hub](#), page 21
- [PTM Base Unit Description](#), page 24
- [Installing a Single PTM Base Unit \(5U Models\)](#), page 25
- [Preparing to Install a PTM \(10U Models\)](#), page 30
- [Adding Extensions to a PTM Base Unit](#), page 35
- [Installing a Longer Belt to an Extended PTM](#), page 40
- [Installing the Extended PTM](#), page 44
- [Cabling the PTM and LAN Hub](#), page 45

## Planning the Installation

---

**Note:** Two unique extension sizes are available: 5 Unit (5U) and 10 Unit (10U). Two-drive models such as the MSL5026/5030/6030 are designated as 5U. Four-drive models such as the MSL5052/5060/6060 are designated as 10U.

---

A PTM can be mounted into the following rack enclosures:

- Compaq 7000/9000/10000 Series
- AlphaServer H9A
- HP rack system/e

Two PTM variations are available:

- A factory-assembled PTM (base unit) that can be used to connect two 5U libraries (one master and one slave).
- The PTM base unit plus extensions with a combined length equal to the number of adjacent MSL Series libraries installed in a rack enclosure.
  - For 5U libraries: one master and up to seven additional slaves.
  - For 10U libraries: one master and up to three additional slaves.
  - Any combination of up to eight MSL Series libraries not to exceed 40 U.

If PTM extensions are required, assemble the entire PTM system before installing it in a multi-unit library configuration.



**Caution:** Do not apply power to any library. Attempting to connect or disconnect a PTM to a library that has power applied can damage the library and the PTM base unit PCB.

---

## Determining the Type and Number of Extensions

The PTM base unit measures 10U. Use the following guidelines to add extensions.

---

**Note:** You cannot add two 5U slaves using a 10U extension kit due to 10-BaseT cable requirements in the kit.

---

### 5U Model as the Master Unit

- If you are adding one 5U as a slave, no additional extensions are required.
- If you are adding one 10U as a slave, an additional 5U extension is required.
- Additional 5U slaves require the addition of a 5U extension kit for each unit after the first.
- Additional 10U slaves require the addition of a 10U extension kit for each unit after the first.

### 10U Model as the Master Unit

- Additional 5U slaves require the addition of a 5U extension kit for each unit.
- Additional 10U slaves require the addition of a 10U extension kit for each unit.

## Positioning the Libraries

The PTM must be attached to the top two libraries in a multi-unit library configuration. Additional slave libraries can be installed anywhere below the first two libraries, in any order.

---

**Note:** Additional standalone libraries may be installed above the multi-unit library configuration.

---

The top library in the multi-library configuration (master) senses the position of each library during initialization at power-up.



**Caution:** To avoid damage to the equipment and loss of data, all multi-unit tape library components (libraries and PTM components) must be LTO Ultrium capable.

---

---

**Note:** All MSL Series libraries in a multi-unit library configuration must use the same drive types. Check with your application software vendor to manage partitioning by tape technology if you want to mix drive types in a multi-unit library configuration. Mixed media using Ultrium cartridges is not supported on libraries with firmware levels of 4.04 or earlier.

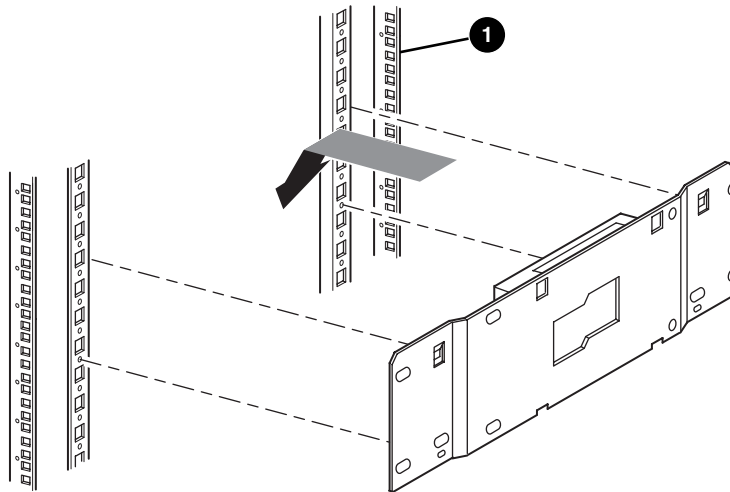
---

## Installing the LAN Hub

An eight-port LAN hub is included in the PTM Upgrade Kit. It comes pre-assembled in its own bracket for installation at the side of a rack enclosure. The LAN hub is used to connect each installed library to a WAN via the 10-BaseT connector on the library controller board for coordinating PTM operation and communication.

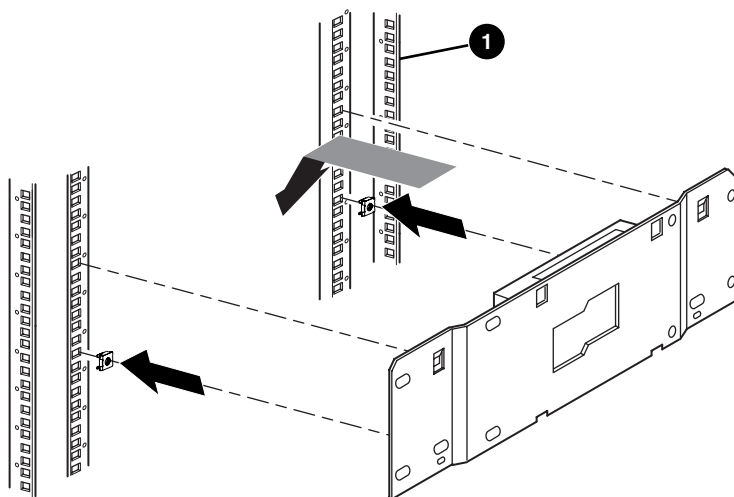
To install the LAN hub:

1. Install cage nuts/clip nuts as indicated in [Figure 1](#) through [Figure 4](#).
2. Carefully install the LAN hub bracket.



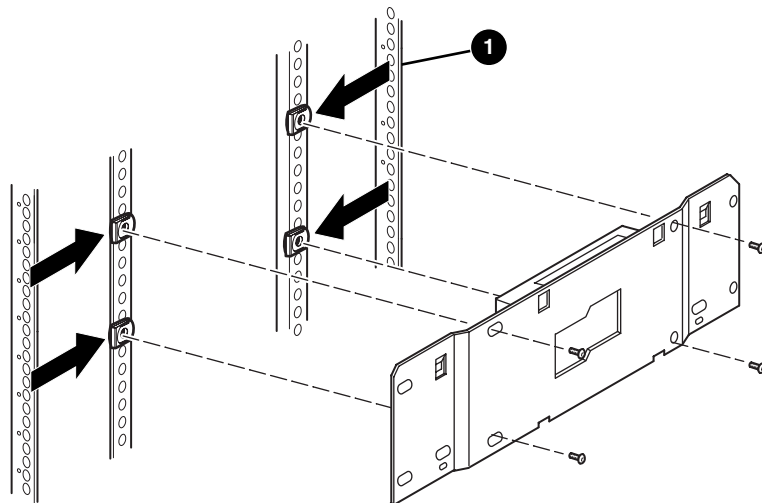
**Figure 1: Installing the LAN hub into a standard 7000/9000/10000 rack enclosure**

- ❶ Front of rack enclosure



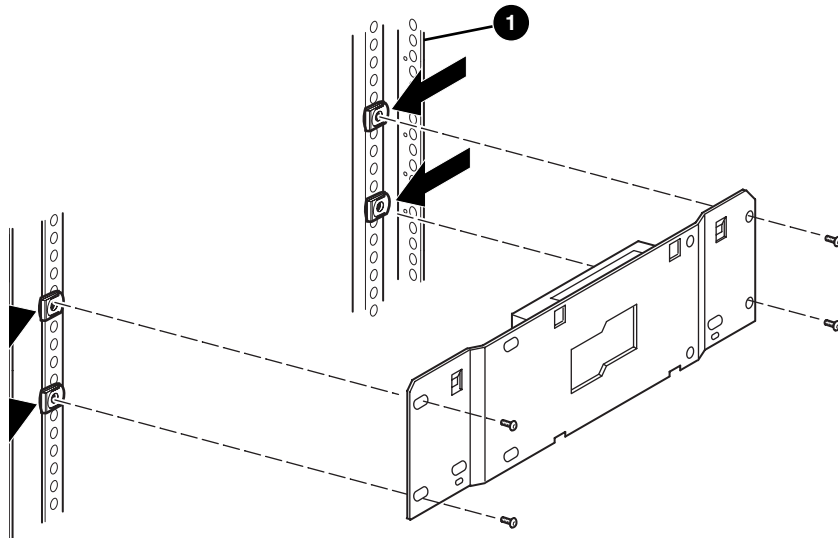
**Figure 2: Installing the LAN hub into a dual RETMA 9000/10000 rack enclosure**

- ❶ Front of rack enclosure



**Figure 3: Installing the LAN hub into an H9A rack enclosure**

- ❶ Front of rack enclosure

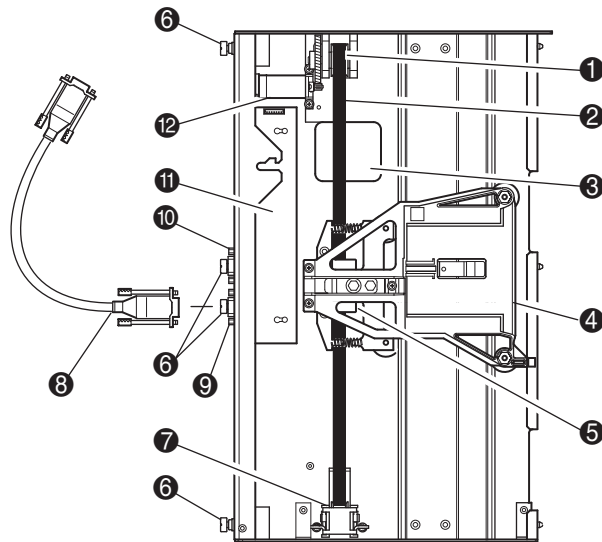


**Figure 4: Installing the LAN hub into a system/e rack**

- ❶ Front of rack enclosure
3. Connect the AC power cable to the LAN hub and to the rack enclosure AC power outlet. Do not turn the LAN hub on at this time.
4. Attach the 10-BaseT cables to the LAN hub for each library. See [“Cabling the PTM and LAN Hub”](#) on page 45 for connecting instructions.
5. Attach a network cable to the LAN hub. See the section on [“Cabling the PTM and LAN Hub”](#) on page 45 for instructions.

## PTM Base Unit Description

The PTM base unit comes factory assembled and contains the following components (see [Figure 5](#)).



- |   |   |
|---|---|
| ① Drive Motor Pulley                    | ⑦ Belt Tensioner Ramp and Idler Pulley          |
| ② Drive Belt                            | ⑧ Primary Motor Cable                           |
| ③ Belt Block Bracket Access Cutout      | ⑨ Primary Motor Cable Connector                 |
| ④ Media Elevator Car                    | ⑩ Reserved for future use                       |
| ⑤ Belt Block and Brackets               | ⑪ Printed Circuit Board (PCB), Motor Controller |
| ⑥ Thumbscrews (Top, Middle, and Bottom) | ⑫ Drive Motor                                   |

**Figure 5: PTM base unit**



## Installing a Single PTM Base Unit (5U Models)

To install a single PTM base unit:

1. Install two 5U libraries, as shown in [Figure 6](#), following the instructions in the *HP StorageWorks MSL5000 and MSL6000 Series Tape Library User Guide*.

---

**Note:** Each library needs to be pulled out sequentially from the front of the rack enclosure to gain access to the top PTM cover plate screw on a lower library. See [Figure 8](#) for screw locations.

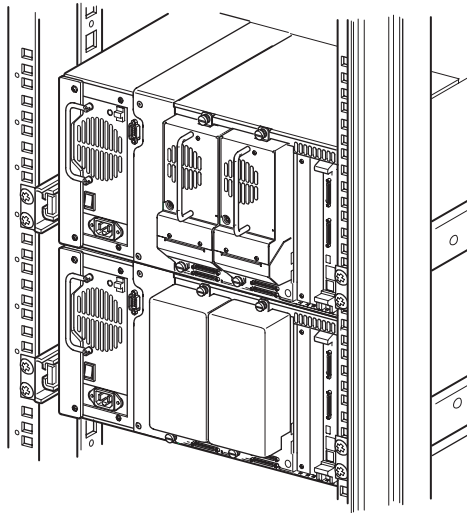
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---

**Caution:** Do not apply power to either library. Attempting to connect or disconnect a PTM base unit to a library that has power applied can damage the library and the PTM base unit PCB.

---



**Figure 6:** 5U library installation (9000 rack enclosure shown)

---

**Note:** After installing the libraries, secure each one to the rack enclosure using its front bezel thumbscrews.

---

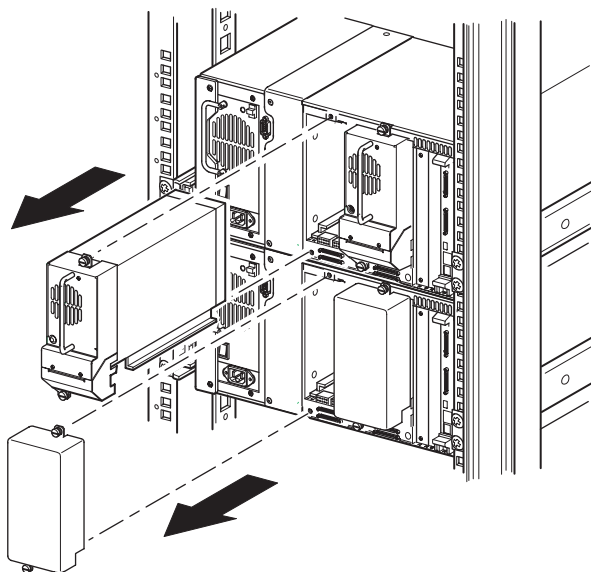
2. Remove the blank panel or drive shoe assembly 1 from the bay adjacent to the PTM cover plate opening (see [Figure 7](#)).
  - a. Loosen the captive retaining screws at the top and bottom of the blank panel or drive shoe assembly 1.
  - b. Remove the blank panel or pull straight back on the drive shoe assembly 1 handle to unplug it.

---

**Note:** Some effort might be required to overcome the initial resistance of unplugging the drive shoe assembly from the hot-plug connector. A gentle wiggling motion may aid removal.

---

- c. Fully disengage drive shoe assembly 1. Continue to slide drive shoe assembly 1 out while supporting it until the tape drive hardware clears the back of the library hot-plug connector.



**Figure 7: Accessing drive bay 1**

3. Remove the PTM cover plate.

---

**Note:** If the PTM cover plate has not previously been removed, each library needs to be pulled out sequentially from the front of the rack enclosure so you can gain access to the top PTM cover plate screw on a lower library.

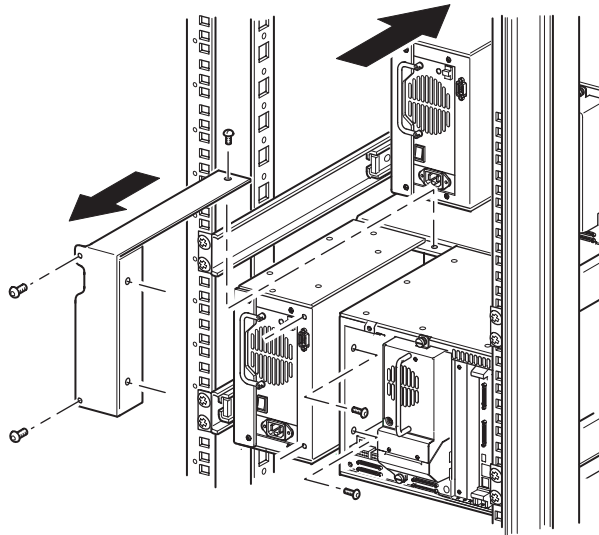
---

- a. Using a #1 Phillips screwdriver, remove the screw securing the cover plate to the top of each library chassis.
- b. Using a stubby or right-angle #2 Phillips screwdriver, remove the screws securing the cover plate to the inside of the drive cage of each library chassis.
- c. Using a #2 Phillips screwdriver, remove the screws that secure the PTM cover plate to the rear of each library chassis (see [Figure 8](#)).

---

**Note:** Do not discard the PTM cover plate or screws. If the unit ever requires shipping, the PTM cover plate must be reinstalled to prevent in-transit damage.

---



**Figure 8: Removing the PTM cover plate**

4. Install the PTM base unit (see [Figure 9](#)).
  - a. Hold the handle while supporting the PTM base unit from the bottom.
  - b. Carefully insert the PTM base unit into the top library making sure the top pins are fully engaged.
  - c. Secure the PTM base unit to the top library using the PTM base unit top and top-middle thumbscrews.

---

**Note:** If the lower pins are difficult to align to the bottom (slave) library, push the slave library slightly forward. Afterwards, engage it by pulling it toward the PTM base unit before tightening the lower thumbscrews.

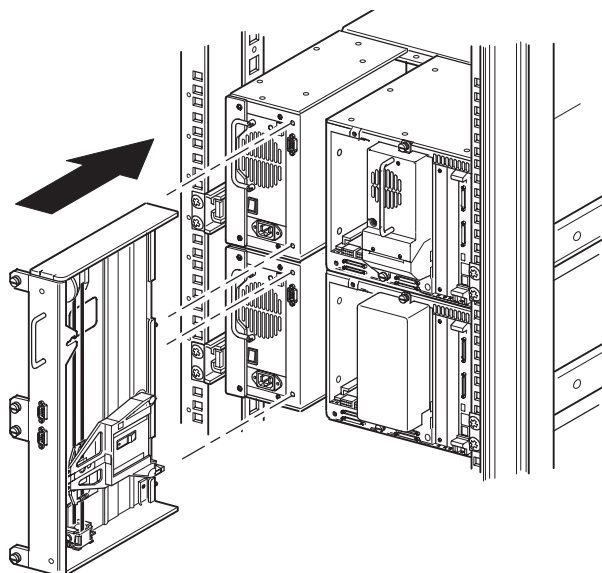
---

- d. Secure the PTM base unit to the bottom library using the PTM base unit bottom-middle and bottom thumbscrews,.

---

**Note:** If you still cannot align the bottom library to the PTM base unit, slightly loosen the rear rail bracket screws for the bottom library, reposition it, and then secure it to the PTM base unit. Afterwards, re-tighten the rear rail bracket screws.

---



**Figure 9: Installing the PTM base unit**

5. Connect the PTM base unit following the instructions in “[Cabling the PTM and LAN Hub](#)” on page 45.
6. If required, install any previously removed drive assemblies and covers.
7. If necessary, tighten the thumbscrews at the front of the unit and replace the bezel.

## Preparing to Install a PTM (10U Models)

To prepare to install a PTM:

---

**Note:** A 10U extension must be added to the PTM base unit to connect two 10U libraries. See [“Adding Extensions to a PTM Base Unit”](#) on page 35.

---

1. Install two 10U libraries as shown in [Figure 10](#) on page 31 following the instructions in the *HP StorageWorks MSL5000 and MSL6000 Series Tape Library User Guide*.

---

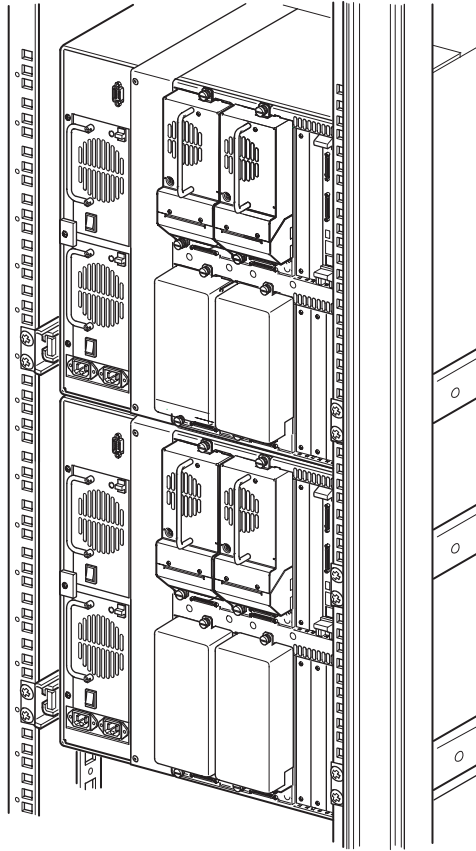
**Note:** Each library needs to be pulled out sequentially from the front of the rack enclosure to gain access to the top PTM cover plate screw on a lower library. See [Figure 12](#) on page 34 for screw locations.

---



**Caution:** Do not apply power to either library. Attempting to connect or disconnect a PTM base unit to a library that has power applied can damage the library and the PTM base unit PCB.

---



**Figure 10: Library installation, 10U models (9000 rack enclosure shown)**

---

**Note:** After installing the libraries, secure each one to the rack enclosure using its front bezel thumbscrews.

---

2. Remove the blank panels or drive shoe assembly 1 and 3 from the bays adjacent to the PTM cover plate openings of each library (see [Figure 11](#) on page 32).
  - a. Loosen the captive retaining screws at the top and bottom of the blank panels or drive shoe assembly 1 and 3.

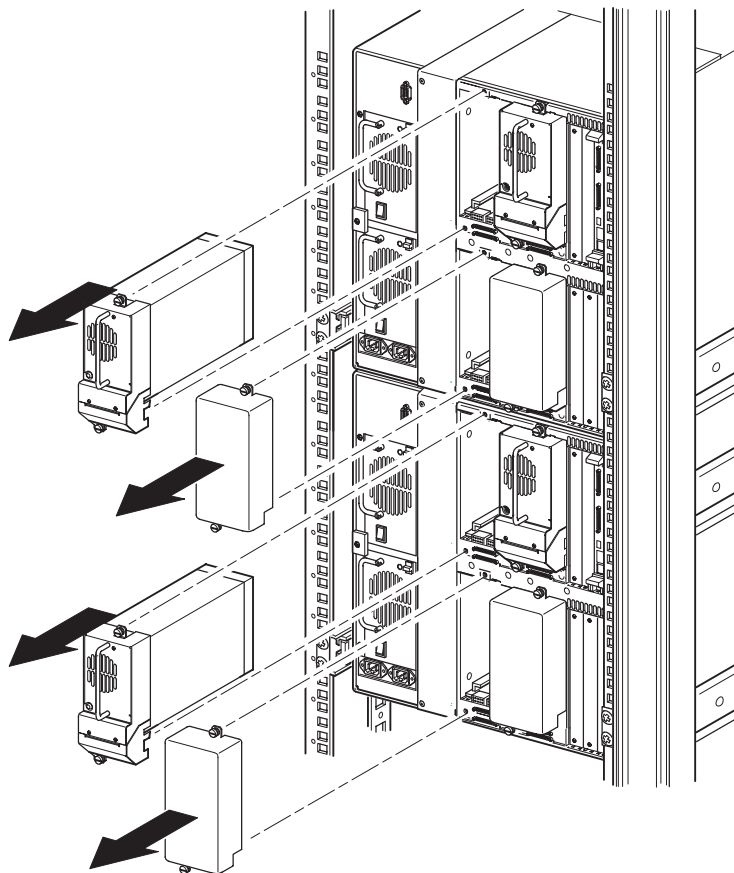
- b. Remove the blank panels or pull straight back on the drive shoe assembly 1 and 3 handles to unplug them.

---

**Note:** Some effort might be required to overcome the initial resistance of unplugging a drive shoe assembly from a hot-plug connector. A gentle wiggling motion may aid removal.

---

- c. Fully disengage drive shoe assembly 1 and 3. Continue to slide drive shoe assembly 1 and 3 out while supporting them until the tape drive hardware clears the back of the library hot-plug connectors.



**Figure 11: Accessing drive bays 1 and 3 (10U models)**



3. Remove the PTM cover plate.

---

**Note:** If the PTM cover plate has not previously been removed, each library needs to be pulled out sequentially from the front of the rack enclosure so you can gain access to the top PTM cover plate screw on a lower library.

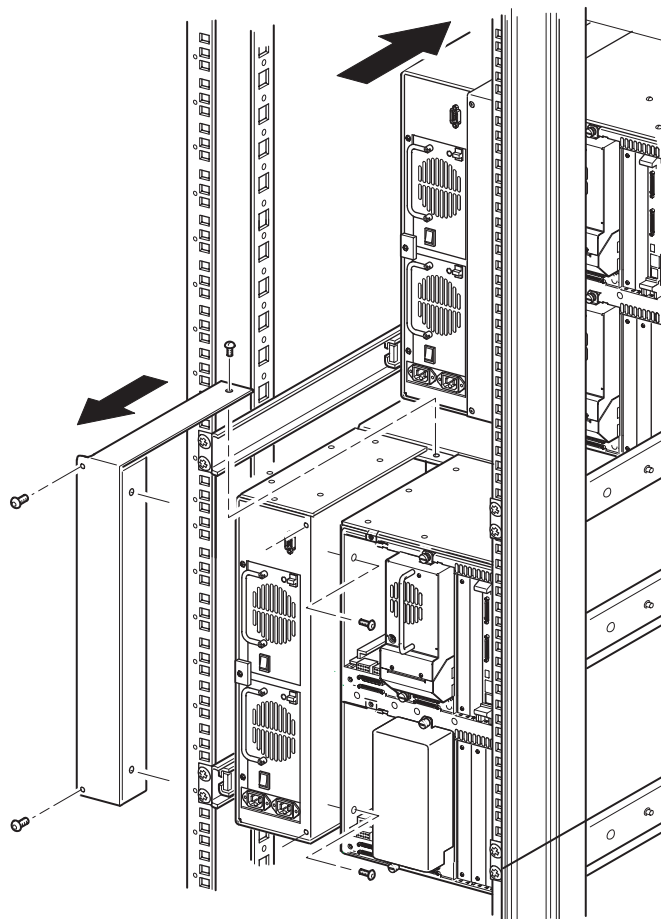
---

- a. Using a #1 Phillips screwdriver, remove the screw securing the cover plate to the top of each library chassis.
- b. Using a stubby or right-angle #2 Phillips screwdriver, remove the screws securing the cover plate to the inside of the drive cage of each library chassis.
- c. Using a #2 Phillips screwdriver, remove the screws that secure the PTM cover plate to the rear of each library chassis (see [Figure 12](#) on page 34).

---

**Note:** Do not discard the PTM cover plate or screws. If the unit ever requires shipping, the PTM cover plate must be reinstalled.

---



**Figure 12: Removing a PTM cover plate (10U models)**

## Adding Extensions to a PTM Base Unit

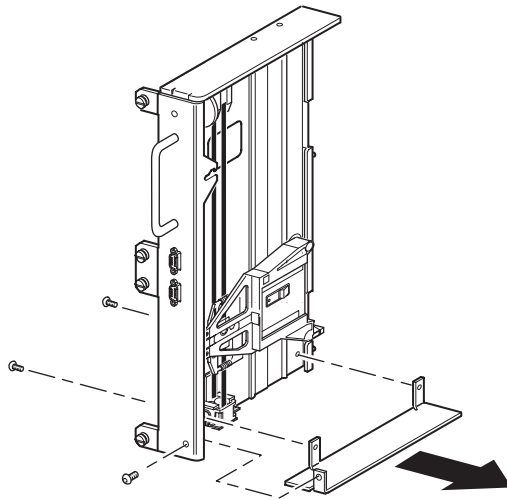
To add extensions to a PTM base unit, you will need a clean, flat work area such as a table or work bench. The surface should be long enough to support the full length of the PTM base unit and all extensions.

---

**Note:** During this procedure, make sure you save all screws, the PTM base unit bottom bracket, and the belt tensioner ramp/idler pulley springs and associated hardware. These items must be reused when adding extensions.

---

1. Remove the bottom plate from the PTM base unit (see [Figure 13](#)).



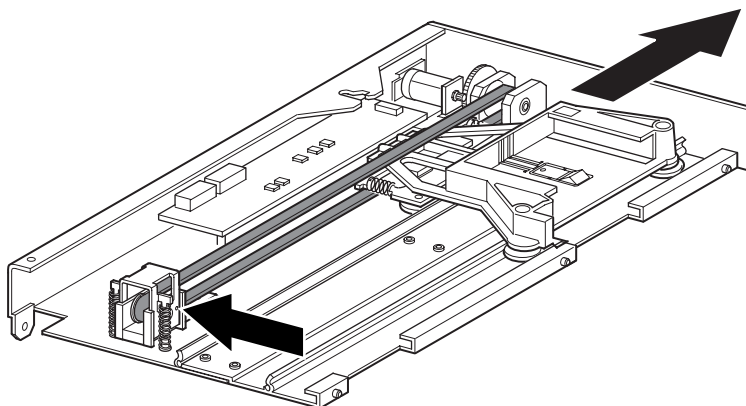
**Figure 13: Removing the bottom plate from the PTM base unit**

2. Slide the media elevator car to the top of the PTM base unit (see [Figure 14](#)). Note that the top of the PTM base unit has the drive motor on it.

---

**Note:** The media elevator car should now be positioned over the belt block bracket access cutout next to the PCB and drive motor.

---



**Figure 14: Media elevator car location**

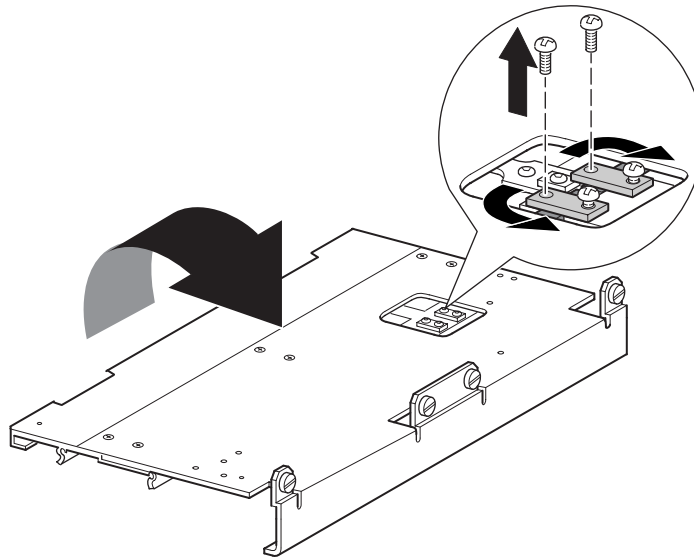
3. Insert a large paper clip through the holes on the idler pulley base to set the idler pulley tension to zero. (See [Figure 19](#) on page 40.)
4. Turn the PTM over to access to the belt block bracket access cutout (see [Figure 15](#) on page 37).



**Caution:** To prevent damage to the PTM media elevator car, it must be supported from underneath any time you are performing procedures on the belt block bracket assembly.

---

5. Remove one screw from each of the two belt block brackets. Loosen the other screw and move each belt block bracket to the side to gain access to the drive belt (see [Figure 15](#) on page 37).



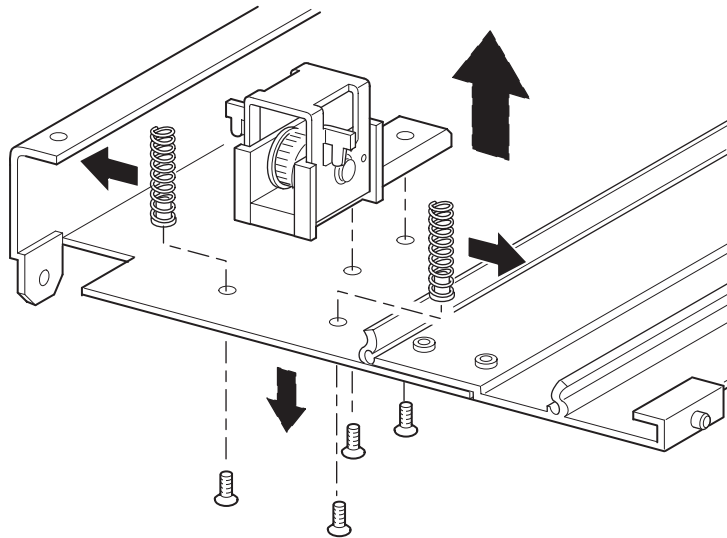
**Figure 15: Belt block bracket access cutout**

6. Turn the PTM base unit over and then remove the drive belt from the media elevator car, the belt tensioner ramp, and the idler pulley (see [Figure 5](#) on page 24).
7. Discard the belt.
8. Remove the belt tensioner ramp and idler pulley components as follows (see [Figure 16](#) on page 38):
  - a. Remove the two screws and springs from the belt tensioner ramp and idler pulley.
  - b. Remove the two screws that secure the belt tensioner ramp and idler pulley to the PTM base unit.
  - c. Remove the belt tensioner ramp and idler pulley.

---

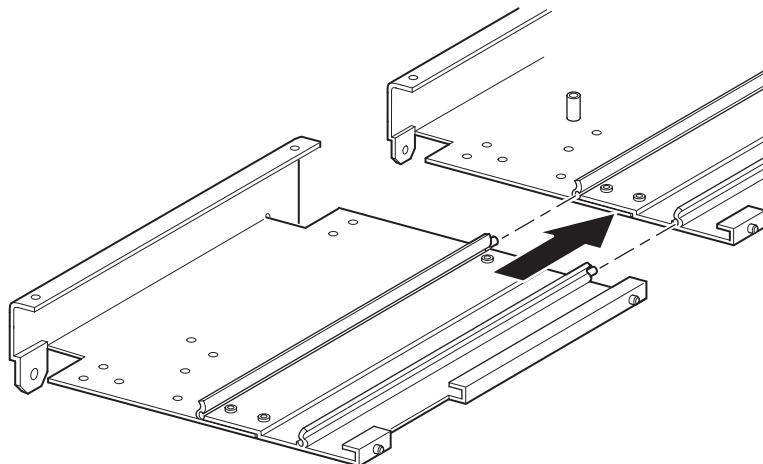
**Note:** Retain the belt tensioner ramp/idler pulley springs and associated hardware for use in the subsequent installation steps. To avoid misplacing this hardware you can use [step 12](#) and [step 13](#) to install it on the last extension at this time, if desired.

---



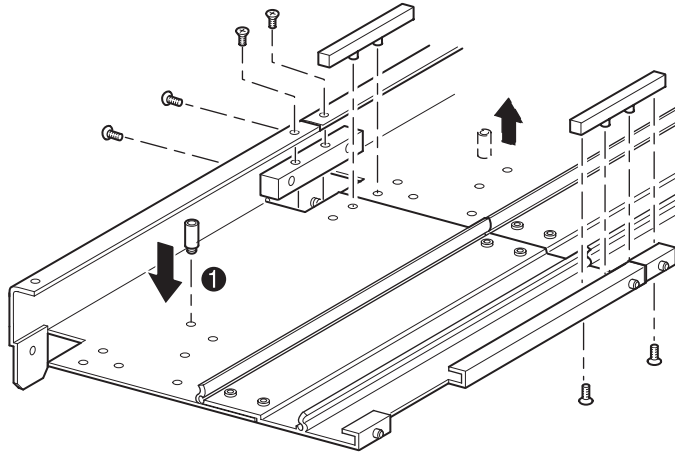
**Figure 16: Removing the belt tensioner ramp and idler pulley**

9. Mount a 5U or 10U extension as follows (see [Figure 17](#)):
  - a. Insert the alignment pins of the extension into the corresponding slots at the bottom of the PTM base unit.



**Figure 17: Mounting a 5U or 10U extension**

- b. Align the pins of the two narrow tie bars with the holes in the extension and PTM base unit (see [Figure 18](#)) and then attach them using four mounting screws (two screws for each narrow tie bar).
- c. Attach the large tie bar (beveled edge to the inside corner of the PTM base unit and extension) using four mounting screws (see [Figure 18](#)).



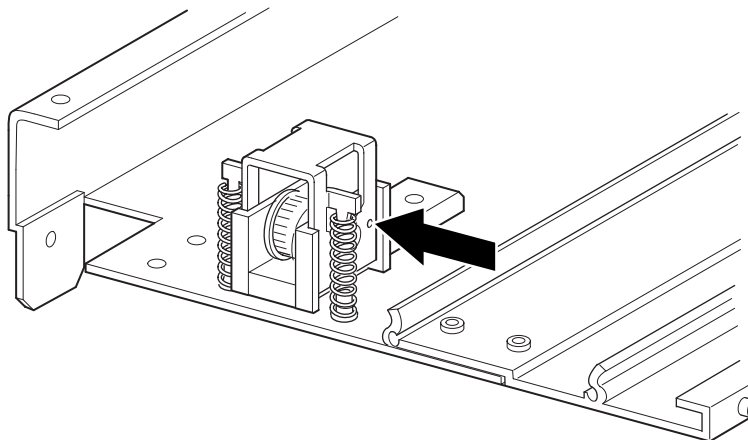
**Figure 18: Installing tie bars**

10. Repeat [step 9](#) for each extension.
11. Remove the bottom stop standoff from the PTM base unit and then attach it to the corresponding mounting hole (❶, [Figure 18](#)) in the last unit of the extended PTM.
12. Secure the belt tensioner ramp and idler pulley to the extension using the two previously removed screws (see [Figure 16](#) on page 38).
13. Secure the belt tensioner ramp and idler pulley springs using the two previously removed screws (see [Figure 16](#) on page 38).

## Installing a Longer Belt to an Extended PTM

To install an extended belt:

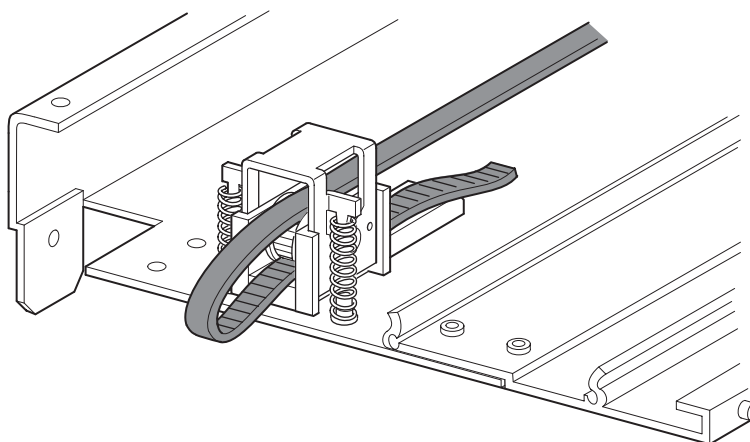
1. On the extension belt tensioner ramp and idler pulley base, compress the springs until the holes in the tensioner ramp are aligned with the holes in the base of the tensioner.
2. Insert a large paper clip through the holes. This sets the idler pulley to the zero position (see [Figure 19](#)).



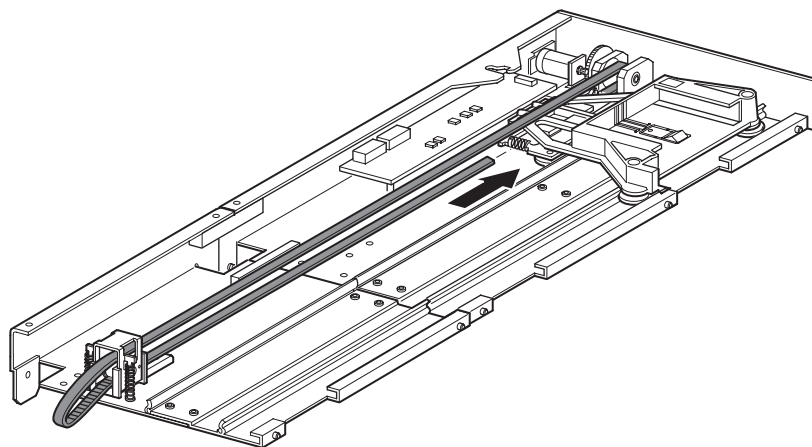
**Figure 19: Tensioner ramp/idler pulley zero point**

3. Thread the timing belt through the top of the belt tensioner ramp and idler pulley and then through the motor drive pulley. Make sure the belt teeth engage both pulleys (see [Figure 20](#) and [Figure 21](#) on page 41).





**Figure 20: Installing the timing belt on the extension**



**Figure 21: Installing the timing belt**

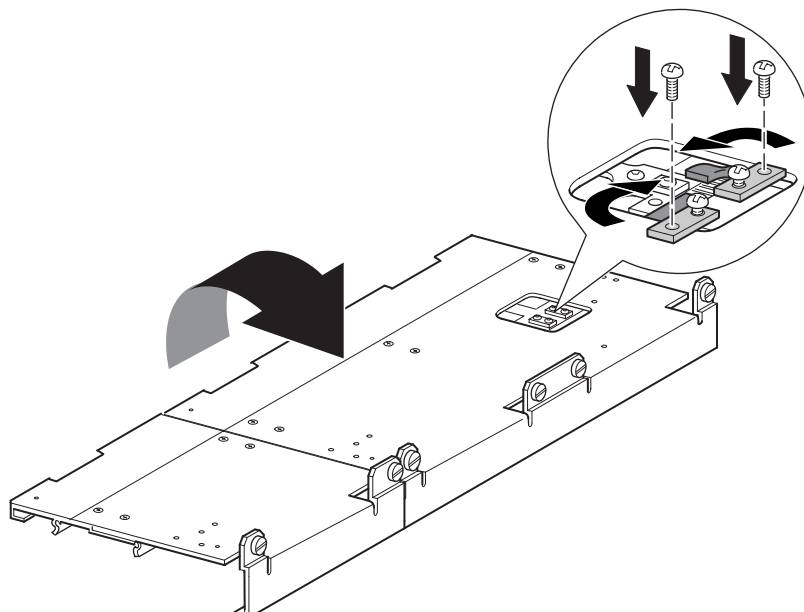
4. Position the media elevator car over the belt block access cutout (see [Figure 14](#) on page 36).
5. Position the ends of the timing belt under the media elevator car at the midpoint of the belt block access cutout.
6. Turn over the PTM.



**Caution:** To prevent damage to the PTM media elevator car it must be supported from underneath any time you are performing procedures on the belt block bracket assembly.

---

7. Place the timing belt ends on the belt block (see [Figure 22](#)).



**Figure 22: Timing belt at the belt block**

8. Use diagonal cutting pliers to cut the drive belt. If the belt was sized properly, a small space between the belt ends should be visible.
9. Secure the timing belt with the two belt brackets and four retaining screws.

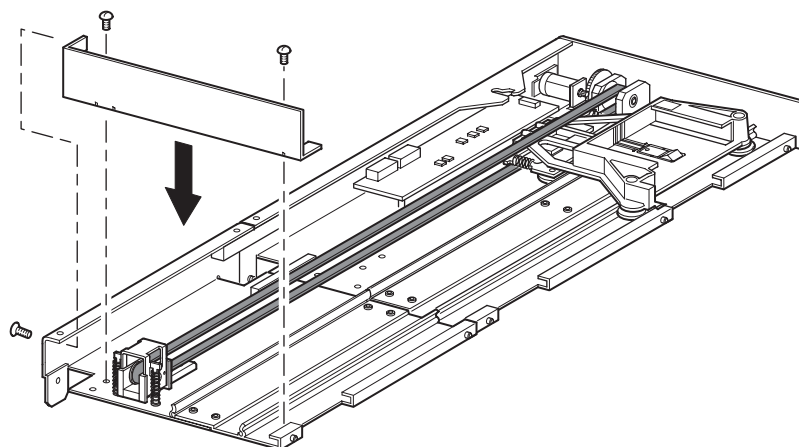
---

**Note:** Secure the timing belt at the top first.

---

10. Remove the previously inserted large paper clip to automatically set initial belt tension.

11. Install the bottom plate that was previously removed from the PTM base unit using the previously removed retaining screws (see [Figure 23](#)).



**Figure 23: Installing the bottom plate**

## Installing the Extended PTM

To install the extended PTM:

1. Use the handle while supporting the PTM base unit from the bottom (see [Figure 9](#) on page 28).
2. Carefully insert the extended PTM into the top library making sure the top pins are fully engaged.
3. Using the PTM extension thumbscrews, secure the extended PTM to the top (master) library.

---

**Note:** If the lower pins are difficult to align to the bottom (slave) libraries, push the slave libraries slightly forward. Afterwards, engage each one by pulling them (one at a time) toward the extended PTM and then tighten the appropriate thumbscrews.

---

---

**Note:** On 10U libraries, the middle holes on the unit are not threaded and are not intended to engage the thumbscrews. The top and bottom thumbscrews secure the PTM extension to the library.

---

4. Using the PTM extension thumbscrews, secure the extended PTM to the remaining libraries (in sequence) for the multi-unit library configuration.

---

**Note:** If you still cannot align a bottom (slave) library to the extended PTM, slightly loosen the rear rail bracket screws for that library, reposition it, and then secure it to the extended PTM. Afterwards, re-tighten all rear rail bracket screws.

---

5. If required, install any previously removed drive assemblies and covers.
6. If necessary, tighten the thumbscrews at the front of the unit.
7. You can now attach the data cables to the extended PTM. See the section on [“Cabling the PTM and LAN Hub”](#) on page 45.

## Cabling the PTM and LAN Hub

This section describes how to connect the data cables to the PTM and LAN hub in a multi-unit library configuration (single master and slave).



---

**Caution:** Do not apply power to any library until cabling is complete. Attempting to connect or disconnect a PTM to a library that has power applied can damage the library and the PTM PCB.

---

After connecting all the appropriate data cables, see “[Configuring the PTM](#)” on page 47 for detailed information about configuring the PTM using the GUI touch screen.

## Multi-Unit Library Configuration (Single Master and Slave)

[Figure 24](#) on page 46 shows how to connect a multi-unit library configuration using a single master and a slave library configuration.

---

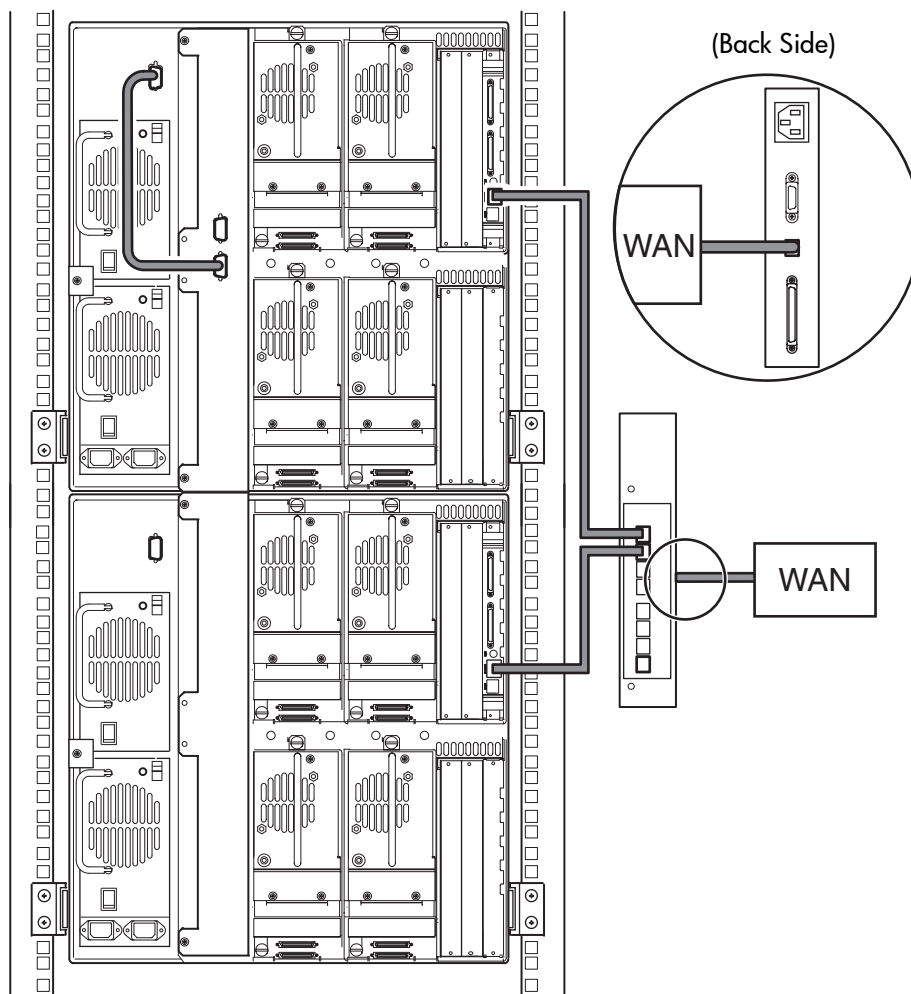
**Note:** All libraries must be powered off.

---

---

**Note:** Refer to the *HP StorageWorks MSL5000 and MSL6000 Series Tape Library User Guide* for information on connecting SCSI cables and SCSI terminators to fit your specific needs and for additional multi-unit library and SCSI configuration information.

---



**Figure 24: 10U multi-unit library configuration (single master and slave)**

---

**Note:** Additional slaves require an extended PTM system. See [“Adding Extensions to a PTM Base Unit”](#) on page 35, [“Installing a Longer Belt to an Extended PTM”](#) on page 40, and [“Installing the Extended PTM”](#) on page 44.

---

# Configuring the PTM

## 3

This chapter describes how to configure a Pass-Through Mechanism (PTM) for an HP StorageWorks MSL5000 or 6000 Series tape library. Sections in this chapter include:

- [Preparing for Configuration](#), page 48
- [Configuring the Master Library](#), page 49
- [Configuring the Slave Libraries](#), page 54
- [Verifying the Configuration](#), page 55
- [Converting a Multi-Unit Library Configuration to Standalone Configuration](#), page 56
- [Verifying the Firmware Level](#), page 57
- [Updating the Firmware](#), page 58

## Preparing for Configuration

After the Pass-Through Mechanism (PTM) has been successfully installed, the libraries must be configured to operate correctly as a multi-unit library configuration.

---

**Note:** The master library has a fully functional GUI. Slave libraries only have partial GUI capabilities.

---

Before configuring the libraries:

1. Make sure the libraries are connected as described in the *HP StorageWorks MSL5000 and MSL6000 Series Tape Library User Guide*.
2. Power on the LAN hub.
3. Turn the libraries on and wait until the Power-On Self Test (POST) completes and the HP initialization or home screen appears on the display. Refer to the *HP StorageWorks MSL5000 and MSL6000 Series Tape Library User Guide* for detailed instructions on power-up procedures.



## Configuring the Master Library

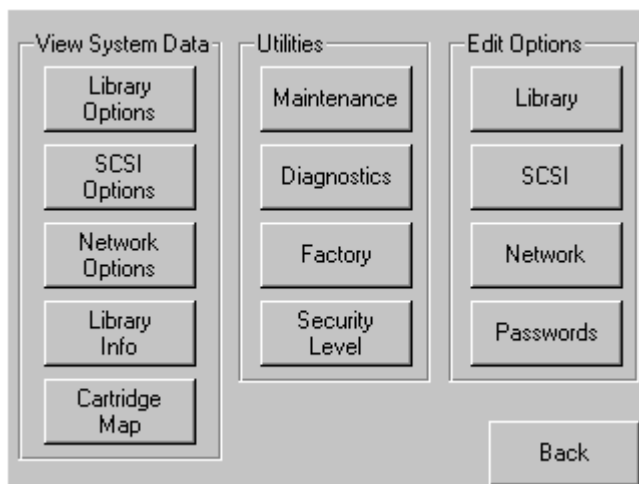
1. Using the Graphical User Interface (GUI) touch screen on the master library, touch the **Menu** button from the **Status** screen (see [Figure 25](#)). Refer to the *HP StorageWorks MSL5000 and MSL6000 Series Tape Library User Guide* for instructions on how to operate the GUI touch screen.

**Note:** Libraries using 2.xx firmware that have previously been configured as slaves must be changed to a standalone first, then configured as a master, or updated to the latest library firmware.



**Figure 25:** Library home screen (MSL6000 shown)

2. Touch the **Library** button from the **Edit Options** area of the GUI (see [Figure 26](#)).



**Figure 26: Menu screen**

---

**Note:** The library status LED indicator flashes green to indicate that a change is being made on the GUI that interrupts the current library operation.

---

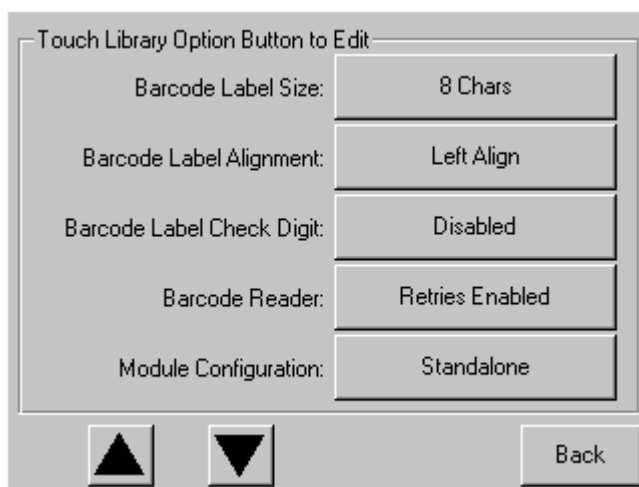
3. Enter the appropriate Service password and then touch the **Validate** button. Refer to the *HP StorageWorks MSL5000 and MSL 6000 Series Tape Library User Guide* for additional information on setting passwords.

4. Press the down arrow (▼) until the **Module Configuration** menu option appears on the bottom of the display (see [Figure 27](#)).

---

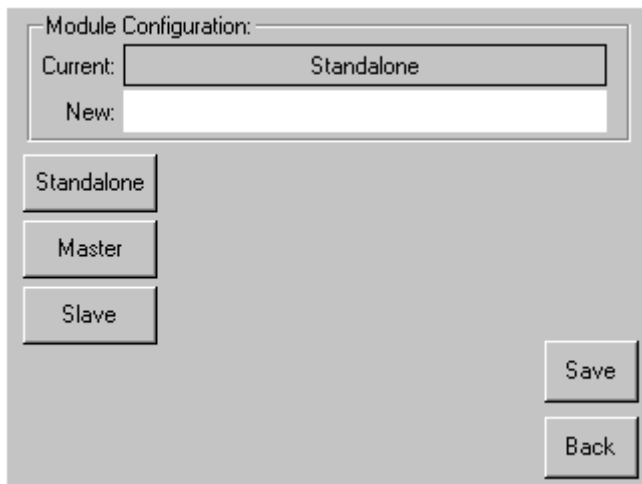
**Note:** You can move to the next sequential **Library** options screen by touching the down arrow (▼). To return to the previous **Library** options screen, touch the up arrow (▲) or **Back** button to return to the **Menu** screen.

---



**Figure 27: Module Configuration select screen**

5. Touch the button next to the **Module Configuration** menu option and then touch the **Master** button (see [Figure 28](#)).



**Figure 28: Module Configuration screen**

6. Touch the **Save** button to confirm your request.

7. Touch **OK** to save the new option. Afterwards, the library will automatically reboot and be configured for the new option (see [Figure 29](#)).

---

**Note:** After the library reboots, the library status LED indicator lights solid green indicating that the library is now fully operational.

---



**Figure 29: Module Configuration confirmation screen**

## Configuring the Slave Libraries

To configure the remaining libraries as slaves:

1. Using the GUI touch screen on a standalone library in a rack enclosure, touch the **Menu** button from the **Status** screen (see [Figure 25](#) on page 49).
2. Touch the **Library** button from the **Edit Options** area of the GUI (see [Figure 26](#) on page 50).

---

**Note:** The library status LED indicator flashes green to indicate that a change is being made on the GUI that interrupts the current library operation.

---

3. Enter the appropriate Service password and then touch the **Validate** button. Refer to the *HP StorageWorks MSL5000 and MSL 6000 Series Tape Library User Guide* for additional information on setting passwords.
4. Touch the down arrow (▼) until the **Module Configuration** menu option appears on the bottom of the display (see [Figure 27](#) on page 51).

---

**Note:** You can move to the next sequential **Library** options screen by touching the down arrow (▼). To return to the previous **Library** options screen, touch the up arrow (▲) or **Back** button to return to the **Menu** screen.

---

5. Touch the button next to the **Module Configuration** menu option and then touch the **Slave** button (see [Figure 28](#) on page 52).
6. Touch the **Save** button to confirm your request.
7. Touch **OK** to save the new option. Afterwards, the library will automatically reboot and be configured for the new option (see [Figure 29](#) on page 53).

---

**Note:** After the library reboots, the library status LED indicator lights solid green indicating that the library is now fully operational.

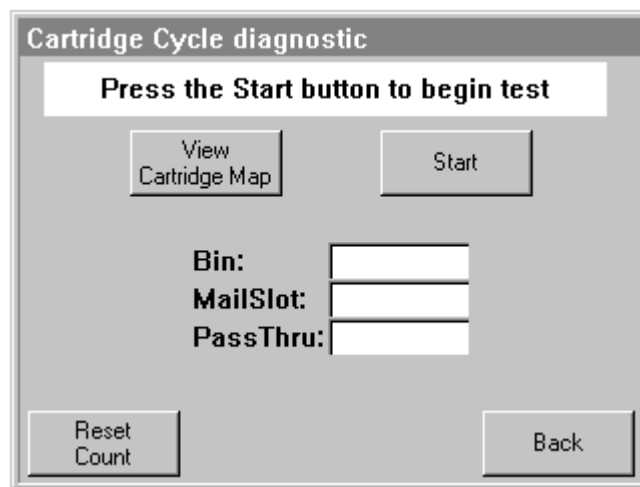
---

8. Repeat this procedure to configure the remaining libraries as slaves.
- The multi-unit library configuration is now ready to verify firmware.

## Verifying the Configuration

To verify the configuration, run the cartridge cycle diagnostic:

1. Load several cartridges into the master unit.
2. Touch **Menu** on the master GUI **Status** Screen.
3. Touch **Diagnostics** (in the **Utilities** area).
4. Enter the appropriate password, if necessary, and validate.
5. Touch **Cartridge Cycle**. The **Cartridge Cycle** diagnostic screen is displayed.



**Figure 30: Cartridge Cycle diagnostic screen**

6. Touch **Start** to begin testing. The message "**Test is running**" will display.
7. Touch **Stop** to end the diagnostic.

## Converting a Multi-Unit Library Configuration to Standalone Configuration

If you are converting a multi-unit library configuration to a standalone configuration, it is beneficial to do so in the following order:

1. Convert the slave unit(s) to standalone.
2. Convert the master unit to standalone.
3. Power off all libraries.



**Caution:** All libraries must be powered off before disconnecting the motor cable. Failure to do so will damage the library and PTM.

---

4. Remove the PTM motor cable.



## Verifying the Firmware Level

The recommended minimum firmware level required for a multi-unit library configuration is 3.19 for DLT only libraries, or 4.04 for LTO Ultrium-compatible libraries.

To verify the firmware level of the master:

1. Apply power to the library:
  - a. Connect each supplied power cord to each power supply receptacle.
  - b. Toggle each power switch on.
  - c. Press anywhere on the GUI touch screen to activate the display and power on the library.

---

**Note:** Refer to the *HP StorageWorks MSL5000 and MSL 6000 Series Tape Library User Guide* for additional information on applying power to a library.

---

2. After POST completes, touch **Menu**.
3. Touch **Library Info** in the **View System Data** area. The firmware revision appears in the **Miscellaneous Library Info** screen.
4. If required, update the master to the correct firmware level.

---

**Note:** After the master is updated, any attached slaves are then automatically updated.

---

## Updating the Firmware

Each MSL Series tape library in a multi-unit library configuration can be flashed individually, using the Remote Management Interface, the *MSLUtil.exe* diagnostic utility and diagnostic cable, or *HP StorageWorks Library and Tape Tools (L&TT)*.

**Note:** If the master is flashed first, the update will propagate to all slaves automatically per the GUI instructions.

## Using the Remote Management Interface

To update the firmware using the Remote Management Interface you need an Ethernet connection to the World Wide Web.

1. Login to the Remote Management Interface.

**Note:** See the *HP StorageWorks MSL5000 and MSL6000 Series Tape Library User Guide* for additional information on setting up and using the Remote Management Interface.

2. Click **Functions**.
3. Scroll down to **Library Flash Operation**.



**Figure 31: Upgrading the firmware using the Remote Management Interface**

4. Select **Flash Library from Remote File** or **Flash Library from Local File**.

---

**Note:** If you select Flash Library from Local File, the \*.bin file must be copied to the /upload directory, which is located on the library at the IP Address/upload.

---

5. Click **Start the Flash**. The library firmware automatically updates.
6. The library will reboot. Verify the firmware level has been updated successfully.

## Using a Serial Connection

To update the firmware using the *MSLUtil.exe* you will need:

- *MSLUtil.exe* and the proper version of firmware, available for download from the HP website at <http://www.hp.com/support>.
- RS-232 cable assembly, serial RJ11 to DB9 connectors
- PC with available serial port

## Firmware Flashing Procedure

1. Install the *MSLUtil.exe* on the PC.
2. Copy the firmware image (\*.bin) into the same directory that the *MSLUtil.exe* was installed.
3. Connect the libraries diagnostic port to the PC using supplied cable assembly.
4. Start the *MSLUtil.exe*.
5. Click **Connect**, select the PC serial port that the cable assembly is connected to, and then click **OK**.
6. Click **Download > Browse**. Navigate to the directory with the firmware image \*.bin.
7. Click **OK**. The library firmware automatically updates.

---

**Note:** If the flash process does not complete, select a lower baud rate option, available under the **Connect** window, and try again.

---

8. The library will reboot. Verify the firmware level has been updated successfully.

## Using HP StorageWorks Library and Tape Tools (L&TT)

HP now offers *HP StorageWorks Library and Tape Tools (L&TT)* as our premiere tape and magneto-optical storage device diagnostic tool.

To provide continued service to our customers, HP provides the *L&TT* software application. *L&TT* is a diagnostic tool that is designed to aid in the installation and maintenance of HP tape and magneto-optical storage products. *L&TT* includes several features designed for use by both HP storage customers and trained service personnel. The key features include:

- Diagnostic tools for tape and magneto-optical devices designed for simple troubleshooting
- Multiple options for retrieving and updating both the latest firmware and the most current version of *L&TT*

Frequent firmware image updates are released on the Internet. For optimal performance, HP recommends that you update your system periodically with the latest device firmware.

*L&TT* is available for download at no cost from the HP website at:

<http://www.hp.com/support/tapetools>.

# Electrostatic Discharge

## 4

To prevent damage to the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor can damage system boards or other static-sensitive devices. This type of damage can reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

## Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm  $\pm$  10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

---

**Note:** For more information on static electricity, or for assistance with product installation, contact your HP authorized reseller.

---

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